Listing of Claims:

1. (Currently Amended)   A computer tomography method comprising the steps:

-        using a radiation source (S) to generate a cone-shaped beam cluster (4) which passes through an examination area (13) and a periodically moving object which is located in the examination area (13),

-        producing a relative movement between the radiation source (S) on the one hand and the object located in the examination area (13) on the other hand, where a trajectory, along which the radiation source moves relative to the object, runs on an imaginary cylindrical surface that surrounds the object,

-        using a detector unit (16) to acquire measured values which depend on the intensity in the beam cluster (4) on the other side of the object, during the relative movement,

-        recording the periodic movement of the object during the acquisition,

-        reconstructing a spatial distribution of the absorption of the periodically moving object from the measured values with the aid of the recorded periodic movement of the object, comprising the steps:

a)   determining the spatial area taken up by the object in the examination area (13),

b)   subjecting the measured values to parallel rebinning in order to form a number of groups, where the beams corresponding to the measured values of each group form beam fans (41...45) which lie in planes that are parallel to one another and to the axis of rotation,

c)   determining for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this measured value was acquired,

d)   determining those groups whose points in time, allocated in step c), lie within periodic, predefined time ranges (H₁),

e)   reconstructing the absorption distribution in the object from the measured values belonging to the groups determined in step d).

2. (Currently Amended)   A computer tomography method as claimed in claim 1, ~~characterized in that~~wherein the determination of the spatial area taken up by the object, in step a), comprises the following steps:

-        reconstructing from the measured values a three-dimensional data record which contains the object, with a resolution which makes it possible to segment the object in the three-dimensional data record,

-        segmenting the object in the three-dimensional data record, where the segmented object shows the spatial area taken up by the object in the examination area ~~(13)~~.

3. (Currently Amended)   A computer tomography method as claimed in claim 1, ~~characterized in that~~wherein in step c) the geometric center of the spatial area taken up by the object in the examination area is determined and for each group a measured value is determined whose beam runs through the geometric center, where the point in time at which this measured value was acquired is allocated to the respective group.

4. (Currently Amended)   A computer tomography method as claimed in claim 1, ~~characterized in that~~wherein the periodically moving object is a heart, where the periodic time ranges ~~(H₁)~~ are predefined with the aid of an electrocardiograph ~~(8)~~.

5. (Currently Amended)   A computer tomography method as claimed in claim 1, ~~characterized in that~~wherein the object moves less in the periodic, predefined time ranges ~~(H₁)~~ than in other time ranges ~~(H₂)~~.

6. (Currently Amended)   A computer tomography method as claimed in claim 1, ~~characterized in that~~wherein the reconstruction is carried out with the aid of a filtered back-projection.

7. (Currently Amended)   A computer tomography method as claimed in claim 1, ~~characterized in that~~wherein the relative movement between the radiation source ~~(S)~~ on the one hand and the object located in the examination area ~~(13)~~ on the other hand comprises a rotation about an axis of rotation ~~(14)~~ and runs in a circular or helix-like manner.

8.. (Currently Amended)   A computer tomography scanner, in particular for carrying out the method as claimed in claim 1, comprising:

-        a radiation source (S) for generating a cone-shaped beam cluster (4) which passes through an examination area (13) and a periodically moving object which is located therein,

-        a drive arrangement (2, 5) for rotating the object located in the examination area and the radiation source (S) relative to one another about an axis of rotation (14) and moving them relative to one another parallel to the axis of rotation (14),

-        a detector unit (16) for acquiring measured values, said detector unit being coupled to the radiation source (S),

-        a movement recording device (8), in particular an electrocardiograph, for recording the periodic movement of the object during the acquisition,

-        at least one reconstruction and image processing computer (10) for reconstructing the spatial distribution of the absorption within the examination area (13) from the measured values acquired by the detector unit, with the aid of the periodic movement of the object recorded by the movement recording device (8),

-        a control unit (7) for controlling the radiation source (S), the drive arrangement (2, 5), the detector unit (16), the movement recording device (8) and the at least one reconstruction and image processing computer (10) in accordance with the following steps:

-        using a radiation source (S) to generate a cone-shaped beam cluster (4) which passes through an examination area (13) and a periodically moving object which is located in the examination area (13),

-        producing a relative movement between the radiation source (S) on the one hand and the object located in the examination area (13) on the other hand, where a trajectory, along which the radiation source moves relative to the object, runs on an imaginary cylindrical surface that surrounds the object,

-        using a detector unit (16) to acquire measured values which depend on the intensity in the beam cluster (4) on the other side of the object, during the relative movement,

-        recording the periodic movement of the object during the acquisition,

-           reconstructing a spatial distribution of the absorption of the periodically moving object from the measured values with the aid of the recorded periodic movement of the object, comprising the steps:

a)   determining the spatial area taken up by the object in the examination area (13),

b)   subjecting the measured values to parallel rebinning in order to form a number of groups, where the beams corresponding to the measured values of each group form beam fans (41...45) which lie in planes that are parallel to one another and to the axis of rotation,

c)   determining for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this measured value was acquired,

d)   determining those groups whose points in time, allocated in step c), lie within periodic, predefined time ranges (H₁),

e)   reconstructing the absorption distribution in the object from the measured values belonging to the groups determined in step d).

9. (Currently Amended)   A computer program for a control unit (7) for controlling a radiation source (S), a drive arrangement (2, 5), a detector unit (16), a movement recording device (8) and at least one reconstruction and image processing computer (10) of a computer tomography scanner, in particular for carrying out the method as claimed in claim 1, as follows:

-           using a radiation source (S) to generate a cone-shaped beam cluster (4) which passes through an examination area (13) and a periodically moving object which is located in the examination area (13),

-           producing a relative movement between the radiation source (S) on the one hand and the object located in the examination area (13) on the other hand, where a trajectory, along which the radiation source moves relative to the object, runs on an imaginary cylindrical surface that surrounds the object,

-           using a detector unit (16) to acquire measured values which depend on the intensity in the beam cluster (4) on the other side of the object, during the relative movement,

-        recording the periodic movement of the object during the acquisition,

-        reconstructing a spatial distribution of the absorption of the periodically moving object from the measured values with the aid of the recorded periodic movement of the object, comprising the steps:

a)   determining the spatial area taken up by the object in the examination area (~~13~~),

b)   subjecting the measured values to parallel rebinning in order to form a number of groups, where the beams corresponding to the measured values of each group form beam fans ~~(41...45)~~ which lie in planes that are parallel to one another and to the axis of rotation,

c)   determining for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this measured value was acquired,

d)   determining those groups whose points in time, allocated in step c), lie within periodic, predefined time ranges ~~(H₁)~~,

e)   reconstructing the absorption distribution in the object from the measured values belonging to the groups determined in step d).

10. (New) A method of reconstructing a spatial distribution of a periodically moving object, comprising:

a) determining the spatial area taken up by the object,

b) forming a number of group from measured values of the object,

c) determining for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this measured value was acquired,

d) determining those groups whose points in time, allocated in c), lie within periodic, predefined time ranges,

e) reconstructing the absorption distribution in the object from the measured values belonging to the groups determined in d).

11. (New) The method of claim 10, wherein the determination of the spatial area taken up by the object, comprises:

(a) reconstructing from the measured values a three-dimensional data record which contains the object, with a resolution which makes it possible to segment the object in the three-dimensional data record,

(b) segmenting the object in the three-dimensional data record, where the segmented object shows the spatial area taken up by the object.

12. (New) The method of claim 10, wherein the periodically moving object is a heart, where the periodic time ranges are predefined with the aid of an electrocardiograph.

13. (New) The method of claim 10, wherein the object moves less in the periodic, predefined time ranges than in other time ranges.

14. (New) An apparatus for reconstructing a spatial distribution of a periodically moving object, comprising:

a) means for determining the spatial area taken up by the object,

b) means for forming a number of group from measured values of the object,

c) means for determining for each group a measured value whose beam irradiates the spatial area taken up by the object, and allocating to the respective group the point in time at which this measured value was acquired,

d) means for determining those groups whose points in time, allocated in c), lie within periodic, predefined time ranges,

e) means for reconstructing the absorption distribution in the object from the measured values belonging to the groups determined in d).